MARS®

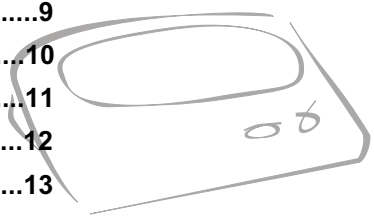
Semi - Auto Digital Blood Pressure Monitor

MS-701K

MS-702

Table of Contents

- Important Notes.....2
- Measurement Accuracy.....2
- Helpful Information.....3
- Correct Method of Measurement.....5
- Parts Identification.....6
- Description of Display Marks.....6
- Preparation before Taking a Measurement.....7
- Taking a Measurement.....8
- Memory Function (For MS-701K Only).....9
- Err Indicators / Troubleshooting.....10
- Care and Maintenance.....11
- Specifications.....12
- Blood Pressure Log.....13



Important Notes

Only a physician is qualified to interpret changes in your blood pressure. This device is not intended to replace regular medical examinations. It is recommended that your physician review your procedure for using this monitor. Never make adjustments to your medication unless it is the advice of a physician.

This Blood Pressure Monitor is intended for use by adults. Children should not use this monitor unless it is under the supervision of an adult.

Don't instead other vendors cuff , Since these will affect Measurement accuracy.

Please read the entire instructions carefully before using this Blood Pressure Monitor.

⚠ Warning Symbol

Type B Symbol

Class II Symbol

Measurement Accuracy

The blood pressure measuring device bears the CE (conformity) label "CE 0044". The quality of the device has been verified and conforms to the provisions of the EC council directive 93/42/EEC of 14 June 1993 on medical devices, as well as the EMC directive 89 /336/EEC:

EN 1060-1

Non-invasive blood pressure measuring equipment General requirements

EN 1060-3

Non-invasive blood pressure measuring equipment Supplementary requirements for electro-mechan ical blood pressure measuring systems

EN 60601-1

Safety requirements for medical electrical equipment

EN 60601-1-2

Electromagnetic compatibility and safety for medical electrical equipment

EN 14971

Risk analysis for medical devices

Accord with riquirement in section 21 of CMDR'S

What Is Blood Pressure?

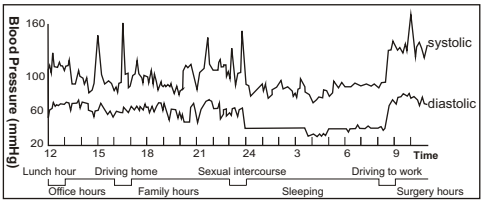
Blood pressure is the force that blood exerts on the arteries. This force is constantly changing as the heart beats. When the heart contracts, blood pressure reaches its highest value. This is called systolic blood pressure. When the heart relaxes between beats, the value of blood pressure is lower. This is called the diastolic blood pressure. The unit of measure for blood pressure is the millimeter of mercury, abbreviated **mmHg**.

For example, an individual's blood pressure may be measured as 120 mmHg (systolic) and 80 mmHg (diastolic). This would be spoken as "120 over 80" and written as "120/80".

Remember that blood pressure varies throughout the day. Food intakes, smoking, time of day, stress, level of exercise and many other factors can affect it.

Typical daily blood pressure fluctuations

(Example : 35-year-old male)



What is High Blood Pressure?

Hypertension, or high blood pressure, is a condition where an individual's blood pressure remains high over a long period of time. Untreated, hypertension can cause many serious medical problems including strokes and heart attacks. To control hypertension, the American Heart Association recommends that you not smoke, reduce fat and salt intake, maintain proper weight, exercise and get regular physical check-ups.

Blood Pressure Classifications

Category	Systolic (mmHg)		Diastolic (mmHg)
Normal*	less than 120	and	less than 80
Pre-hypertension	120-139	or	80-89
Hypertension			
Stage 1	140-159	or	90-99
Stage 2	160 or higher	or	100 or higher

(From the Seventh Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure.)

Why Is It Important to Measure Your Blood Pressure at Home?

Having your blood pressure taken at the doctor's office may cause you to become nervous, thus artificially raising your reading. Having the ability to take your blood pressure at home makes it easy to record a log of your daily readings.

This will help you gain a greater understanding of your blood pressure reading and the factors that affect it. Be sure that you share your information with your physician.

Hints for Accurate Measurement

1. Relax and try to remain still for 5 to 10 minutes before a measurement.
2. Remove any clothing on the upper arm so that the cuff can be placed directly on the skin.
   Constriction of the upper arm caused by rolling up a shirt sleeve may cause and inaccurate reading.
   Avoid this condition by completely removing the garment causing the constriction.

3. Refrain from eating, smoking, and drinking (especially alcoholic beverages) before a measurement since these activities can affect your blood pressure.
4. **Remember that blood pressure varies continuously throughout the day. Try to take your blood pressure at the same time each day.**
5. Do not be concerned with the results of one measurement. Many measurements, recorded over a long period of time, will provide a better indication of your

blood pressure.

6. Please relax for 5 to 10 minutes before taking another measurement.

7. Many factors can affect your blood pressure such as exercising, eating, talking, moving, nervousness, environment and temperature changes. Emotional stress can cause an increase in blood pressure. Daily fluctuations of 25 to 50 mmHg are common.

Please note :

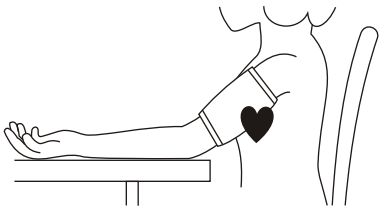
Some individuals with hypertension, diabetes, kidney disorders, arteriosclerosis or poor circulation may see a significant difference in blood pressure readings taken from the wrist as compared to readings from the upper arm. It is recommended that you consult with your physician concerning the use of this monitor.

To obtain the most accurate blood pressure measurement, please follow these important directions.

· Be seated in a chair with back support.

· Rest your arm on a table so the cuff is at the same level as your heart.

· Place both feet on the ground.

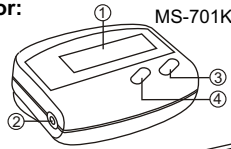


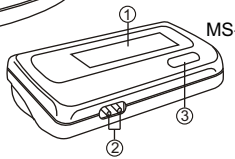
IMPORTANT :

The arm cuff must be at the same level as your heart, or accurate measurement will not be possible. (Your heart is located slightly below your left armpit.)

Parts Identification

• **Monitor:**

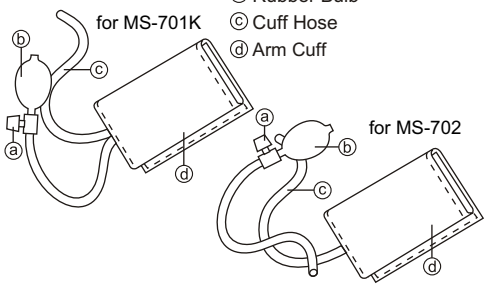




① LCD Display
② Air Tube Socket
③ ON / OFF Button
④ MEMORY Button

• **Accessories:**

ⓐ Exhaust Value Push Button
ⓑ Rubber Bulb
ⓒ Cuff Hose
ⓓ Arm Cuff



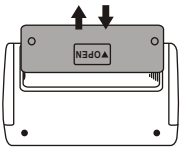
Description of Display Marks

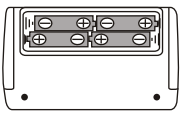
	Deflating
	Inflating
	Measurement Error
	Measuring
	Low Battery

Preparation before Taking a Measurement

Battery Installation / Replacement

1. Slide the battery cover off in the direction of the arrow.
2. **Install or replace the four batteries,** noting the proper orientation of positive (+) and negative (-) terminals of the batteries in the battery compartment.
3. Replace the battery cover.
4. If the Low Battery Symbol appears on the display, replace both batteries.
5. Remove the batteries if the unit will not be used for an extended period of time.



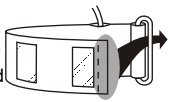


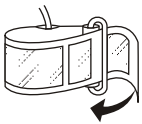
Note : Batteries are hazardous waste. Do not dispose them together with the household garbage.

How to Apply the Wrist Cuff

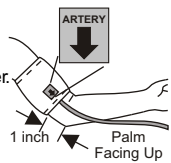
(These directions are for either right or left hand measurements.)

1. With your palm side up, apply the cuff so that the cuff's edge should be approximately 1cm from your palm. You can use the width of your forefinger as a simple way to measure the distance between the cuff and palm.





2. Do not apply wrist unit on top of a shirt sleeve.
3. Wrap the cuff snugly around your wrist and attach using the fastener. The top and bottom edges of the cuff should be tightened evenly around your wrist.



4. Any gap between the wrist and cuff will affect the result of measurement.
5. The fabric cuff can be folded down for ease of viewing the display.

Taking a Measurement

Please review the previous sections on proper placement of the cuff and proper arm position.

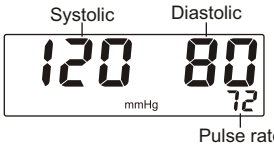
1. After the cuff has been properly placed on either the right or left arm, press the **ON/OFF** button. All symbols on the LCD display will appear momentarily. If you see a downward arrow symbol, press the exhaust valve located between the inflation bulb and the tube to release the residual pressure in the cuff.

   Note : The battery symbol will also appear at this time for checking power level. This does not indicate a low battery unless the low battery symbol remains on continuously.

2. After "0" is displayed, you can pressurize the cuff by squeezing the bulb until the pressure value is 50 mmHg passed your suspected systolic pressure.

3. The unit will automatically deflate after you stop pressurizing the cuff. If you see an upward arrow symbol being displayed, that means you need to inflate the cuff to a higher pressure than you did the first time. If you do not see this symbol, it means it is taking your measurement. Please remain calm and still to avoid causing any measurement error.

4. The unit will completely deflate when measurement is finished. The systolic, diastolic pressure and pulse will be displayed.



If for any reason you would like to stop the measurement in progress, just press the exhaust valve to release the pressure and turn off the unit.

If during a measurement the power drops to an insufficient level, the unit will end the measurement and display the low battery symbol. Please replace the batteries and repeat the measurement.

If the unit cannot detect your pulse, it will end the measurement attempt. Wait a few minutes, make sure that the cuff is positioned properly, and try again.

The unit will automatically shut off 3 minutes following a reading, or it can be turned off manually by pressing the ON/OFF button.

Memory Function (For MS-701K Only)

Memory Input

Your Automatic Digital Blood Pressure Monitor has a memory feature. When a valid measurement is made, the reading data (systolic, diastolic and pulse rate) will be stored in the memory automatically as soon as the unit is turned off, automatically shuts off, or when another measurement is initiated.

The unit has the capacity to store 7 readings, and also computes an average of up to the 7 memory readings. When more than 7 readings are taken and recorded to memory, the oldest ones will be deleted.

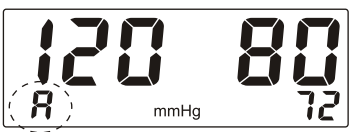
Memory Recall

By pressing the **MEMORY** button, you will see "A" in the lower left hand corner of the display. It means you are looking at the average of all the measurement results. Pressing the **MEMORY** button again, the newest set of measurement results is indicated by "1". Press it again, the next set will be displayed.

Memory Erase

When the batteries are taken out of the monitor, all records will be erased.

Note : When taking a measurement, the **MEMORY** button is inactive.



Memory Number

Err Indicators / Troubleshooting

Error Indicators

Error indicator	Possible sources of errors
Err 330	Indication: Cuff pressure reaches 330 mmHg. Cause: Twisted bladder inside of the cuff. Correction: Make sure that the bladder lays flat within the cuff.
Err	Indication: Display "Err", cuff pressure releases and "0" pressure display. Cause: Excessive arm movement or talking during measurement. Correction: Turn off and on the unit and measure again while keeping still.
	Indication: Could not obtain pulse rate. Cause: Cuff was loosely applied, extremely weak pulse or arrhythmia. Correction: Reapply cuff and measure again.
	Batteries are exhausted. MS-701K: Replace with four new "AA" batteries. MS-702: Replace with four new "AAA" batteries.

Troubleshooting

Problem	Recommended Action
Nothing appears in display	• Make sure that the batteries are installed in the proper direction. (Polarity matches to the indications in the battery case.)
No measurement occurs	• Check that the cuff is positioned properly. • Go over the measurement procedure again.
Blood pressure readings are too high or low	• Check if the wrist is positioned properly. • Rest your arm on a table so that the cuff is level with your heart during measurement. • Remain seated during the entire measurement period. • Refrain from hand and body movements during measurement.
Blood pressure readings are variable	• Your blood pressure can fluctuate considerably through out the day. All of the following factors can influence your blood pressure: · Emotional state · Daily activities or exercise · Smoking · Drinking alcoholic beverages · Eating · Taking certain medications

Care and Maintenance

- Keep the unit out of locations with high temperatures or high humidity, and keep it out of direct sunlight.
- Keep sharp objects away from the cuff.
- Do not inflate the cuff without it is being put on to the arm to avoid damage to the cuff.
- Use the unit at a sufficient distance from devices with strong electrical fields, such as television, microwave ovens, X-ray equipment, etc.
- Do not subject the unit to strong impacts or drop it on the floor.
- Remove the batteries when the unit is to be stored for extended periods of time.

  Note : Removing the batteries will erase all readings in memory.

- Use only a soft dry cloth to clean the unit. Do not use solvents or other petroleum based cleaners.
- Circuit diagram and repairable part can be provided if it's nessary.

Specifications

Model:	MS-701K / MS-702
Measuring method:	Oscillometric
Memory function:	Storage and recall of 7 measurements with average (For MS-701K Only)
Display:	Digital LCD
Measuring range:	Pressure: 20 - 280 mmHg Pulse: 40 - 180 /minute
Measuring accuracy:	Pressure: ±3 mmHg Pulse: ±5%
Inflation system:	Manual inflation with air pumping bulb
Deflation system:	Automatic deflation
Arm size ranges:	22 - 33 cm (9 - 13 inches)
Batteries:	MS-701K : 1.5V (LR6/AA) x 4 MS-702 : 1.5V (LR3/AAA) x 4
Automatic power-off:	Approx. 3 minutes after measurement
Reference method for clinical trials:	Auscultatory measurement
Weight:	Approx. 160 g (without batteries)
Storage and transport condition:	-10°C ~ +60°C, 10% ~ 95% RH
Operating condition:	+10°C ~ +40°C, 10% ~ 85% RH
Standard cited	EN 1060-1 EN 1060-3 EN 60601-1 EN 60601-1-2 EN 14971 CMDCAS

Blood Pressure Log

Date	1/1	1/1	1/1							
Time	7:00	13:30	20:00							
mmHg 240										
220										
200										
180										
160										
140										
	128	134								
120			123							
100										
		90								
80	84									
			76							
60										
Pulse	70	73	69							
Body Condition										

MARS®

MANUFACTURER

Mars Medical Products Co., Ltd.

1/Fl., No. 236, Ho Bin N. St.,
San-Chung City, Taipei, Taiwan
http://www.mars.com.tw

Obelis s.a.,

Bd. Général Wahis 53, 1030 Brussels,Belgium
Tel : +32.2.732.59.54 Fax : +32.2.732.60.03
E-mail : mail@obelis.net

MBM-MS1U9-ED3